WHAT IS CLAIMED IS:

1. A light diffusing film for a back light display comprising:

a unitary film consisting essentially of polycarbonate and a uniformly dispersed anti-static material in an amount sufficient to impart anti-static properties to the film.

2. The light diffusing film as set forth in Claim 1, wherein the surface resistivity of the film is below about 10^{15} ohm/square.

3. The light diffusing film as set forth in Claim 1, wherein said film additionally comprises at least one textured surface for the low scattering of light having a haze of less than 50%.

4. The light diffusing film as set forth in Claim 1, wherein said film additionally comprising a uniformly dispersed acrylic bulk scattering additive for the high scattering of light having a haze of greater than 80%.

5. The light diffusing film as set forth in Claim 1, wherein the film comprises at least one textured surface comprises a random matte textured surface.

6. The light diffusing film as set forth in Claim 1, wherein the film comprises at least one textured surface comprises two random matte textured surfaces.

7. The light diffusing film as set forth in Claim 1, wherein the film has a thickness of about 0.025 mm to about 0.5 mm.

8. The light diffusing film as set forth in Claim 1, wherein the film has a gloss value according to ASTM standard D523 of less than about 50.

9. The light diffusing film as set forth in Claim 1, wherein the film has a gloss value according to ASTM standard D523 of greater than about 90.

10. The light diffusing film as set forth in Claim 1, wherein said film additionally comprising at least one textured surface for the low scattering of light.

11. The light diffusing film as set forth in Claim 1, further comprising an ultraviolet absorber (UVA) component in an effective amount to reduce discoloration of the film when exposed to ultraviolet (UV) light.

12. The light diffusing film as set forth in Claim 11, wherein the UVA component is present in the amount of from 0.01 to 1% by weight of the light diffusion film.

13. The light diffusing film as set forth in Claim 11, wherein the UVA component is present in the amount of from 0.05 to 0.5% by weight of the light diffusion film.

14. The light diffusing film as set forth in Claim 11, wherein the UVA component has a 10% weight loss temperature of above 240 °C.

15. The light diffusing film as set forth in Claim 14, wherein the UVA component has a 10% weight loss temperature of above 350 °C.

16. The light diffusing film as set forth in Claim 11, wherein the UVA component comprises a material selected from the group consisting of hydroxybenzophenones, hydroxyphenyl benzotriazoles, cyanoacrylates, oxanilides, hydroxyphenyl triazines and benzoxazinones.

17. The light diffusing film as set forth in Claim 11, wherein the UVA component comprises a material selected from the group consisting of hydroxyphenyl benzotriazoles and benzoxazinones.

18. The light diffusing film as set forth in Claim 11, wherein the UVA component comprises a benzoxazinone material.

19. The light diffusing film as set forth in Claim 11, wherein the color shift of the film after 200 hours of accelerated weathering according to the ASTM D4674 method 3 is $dx < 0.0005$ and $dy < 0.0005$, where dx is the shift in the x chromaticity coordinate and dy is the shift in the y chromaticity coordinate according to CIE 1931, and wherein

the color shift is measured in reflectance mode using a D65 illuminant and an observer angle of 10°.

20. The light diffusing film as set forth in Claim 11, wherein the color shift after 50,000 hours operational use in a single lamp LCD is $dx < 0.0005$ and $dy < 0.0005$, where dx is the shift in the x chromaticity coordinate and dy is the shift in the y chromaticity coordinate according to CIE 1931.

21. The light diffusing film as set forth in Claim 11, wherein a color shift of a resin material of the film after five minutes at 500 °F is $dy < 0.0040$, where dy is the shift in the y chromaticity coordinate according to CIE 1931.

22. The light diffusing film as set forth in Claim 11, wherein a color shift of a resin material of the film after five minutes at 500 °F is $dy < 0.0020$, where dy is the shift in the y chromaticity coordinate according to CIE 1931.

23. The light diffusing film as set forth in Claim 11, wherein the addition of the UVA component induces a change in yellowness index (YI) in the film, $\Delta YI < 1$.

24. The light diffusing film as set forth in Claim 11, wherein the addition of the UVA component induces a change in yellowness index (YI) in the film; $\Delta YI < 0.1$.

25. The light diffusing film as set forth in Claim 1, wherein the film has a retardation value of less than about 100 nm.

26. The light diffusing film as set forth in Claim 25, wherein the film has a retardation value of less than about 50 nm.

27. The light diffusing film as set forth in Claim 25, wherein the film has a retardation value of less than about 21 nm.

28. The light diffusing film as set forth in Claim 1, wherein the film has less than 4 point defects between 0.10 and 0.15 mm nominal diameter per 10 square foot inspection area.

29. The light diffusing film as set forth in Claim 1, wherein the film has less than 4 black spot point defects larger than 0.15 mm nominal diameter per 40 square foot inspection area.

30. The light diffusing film as set forth in Claim 1, wherein the film has a protective masking film laminated to the surface with a peel test capability of between 0.17 and 1.06 oz/in

31. An assembly for an optical film comprising:
the light diffusion film of claim 1,
a backing film; and
a pressure sensitive adhesive adhering the backing film to the light diffusion film.

32. The assembly as set forth in Claim 31, wherein said light diffusing film additionally comprises at least one textured surface for the low scattering of light having a haze of less than 50%.

33. The assembly as set forth in Claim 31, wherein said light diffusing film additionally comprising a uniformly dispersed acrylic bulk scattering additive for the high scattering of light having a haze of greater than 80%.

34. The assembly of claim 31, wherein the backing film comprises a material selected from the group consisting of polyethylene and polypropylene.

35. The light diffusing film as set forth in Claim 1, wherein the film has a weight loss of 0.0020gms or less in 100 rounds of Taber testing.

36. A process for making a light diffusing film, comprising:
texturing a calendaring roll to form a textured calendaring roll; and
using the textured calendaring roll to form the light diffusing film of claim 1.

37. The process for making a light diffusing film as set forth in Claim 36, wherein the texturing comprises grit blasting.

38. The process for making a light diffusing film as set forth in Claim 37, wherein the grit blasting utilizes 60 to 120 grit Aluminum Oxide.

39. The process for making a light diffusing film as set forth in Claim 37, wherein the grit blasting utilizes pressures less than about 50 psi.

40. The process for making a light diffusing film as set forth in Claim 37, wherein the grit blasting utilizes pressures of about 50 psi, and the metallurgy of the calendaring roll is 58CrMoV4.

41. The process for making a light diffusing film as set forth in Claim 36, wherein the texturing comprises Electron Discharge Texturing.

42. A process for making a light diffusing film, comprising:

using a polymeric coated melt calendaring roll to form the light diffusing film of claim 1.

43. The process for making a light diffusing film as set forth in Claim 42, wherein polymeric coated melt calendaring roll comprises a silicone compound.

44. The process for making a light diffusing film as set forth in Claim 42, wherein polymeric coated melt calendaring roll comprises a polymer layer between 0.1 and 0.5 inches thick having a Shore A durometer value of between 50 and 80.

45. A process for making a light diffusing film, comprising:

forming an assembly comprising the light diffusion film of claim 1, a backing film, and a pressure sensitive adhesive adhering the backing film to the light diffusion film; and

removing the backing film from the light diffusion film.

46. The light diffusing film as set forth in Claim 1, wherein the film flatness is less than 0.1 inches.

47. The light diffusing film as set forth in Claim 1, wherein the film flatness is less than 0.01 inches.

48. The light diffusing film as set forth in Claim 1, wherein the edge curl of the film is less than 0.08 inches.

49. The light diffusing film as set forth in Claim 1, wherein the edge curl of the film is less than 0.06 inches.

50. The light diffusing film as set forth in Claim 1, wherein the film bagginess is less than 0. 05 inches.

51. The light diffusing film as set forth in Claim 1, wherein the film has a surface with a surface Ra greater than 0.6 microns.

52. The light diffusing film as set forth in Claim 1, wherein the film has a surface with a surface Ra greater than 0.7 microns.

53. A light diffusing film for a back light display comprising:

a unitary film consisting essentially of polycarbonate and a uniformly dispersed anti-static material comprising a fluorinated phosphonium sulfonate in an amount sufficient to impart anti-static properties to the film,

said film additionally comprising at least one textured surface for the low scattering of light, or

said film additionally comprising a uniformly dispersed acrylic bulk scattering additive of particles having a mean particle size of from about 3 to about 10 microns and present in an amount from about 2 to about 7 percent by weight percent for the high scattering of light.

54. The light diffusing film as set forth in Claim 53, wherein the acrylic bulk scattering additive comprises a poly(acrylate), or poly(alkyl methacrylate), wherein alkyl groups of the acrylic bulk scattering additive have from one to about twelve carbon atoms.

55. The light diffusing film as set forth in Claim 53, wherein the particles comprise a poly(alkyl methacrylate), wherein the alkyl groups of the poly(alkyl methacrylate) have from one to about twelve carbon atoms.

56. The light diffusing film as set forth in Claim 55, wherein the acrylic bulk scattering additive comprises poly(alkyl methacrylate) comprising poly(methyl methacrylate).

57. The light diffusing film as set forth in Claim 53, wherein said film additionally comprising a uniformly dispersed acrylic bulk scattering additive of particles having a mean particle size of from about 3 to about 10 micrometers and present in an amount from about 2 to about 7 percent by weight percent for the high scattering of light.

58. The light diffusing film as set forth in Claim 53, wherein said antistatic additive is a fluorinated phosphonium sulfonate having the general formula: $\{CF_3(CF_2)_n(SO_3)\}^{\theta}$ $\{P(R_1)(R_2)(R_3)(R_4)\}^{\Phi}$ wherein F is fluorine; n is an integer of from 1-12, S is sulfur; R_1, R_2 and R_3 are the same, each having an aliphatic hydrocarbon radical of 1-8 carbon atoms or an aromatic hydrocarbon radical of 6-12 carbon atoms and R_4 is a hydrocarbon radical of 1-18 carbon atoms.

59. The light diffusing film as set forth in Claim 53, wherein the surface resistivity of the film is less than 10^{15} ohm/square.

60. The light diffusing film as set forth in Claim 53, wherein static decay of the film is less than 200 seconds.

61. A backlight display device comprising:

an optical source for generating light;

a light guide for guiding the light therealong;

a unitary film consisting essentially of polycarbonate and a uniformly dispersed anti-static material in an amount sufficient to impart anti-static properties to the film.

62. The backlight display device as set forth in Claim 61, wherein the film comprises at least one textured surface comprising a random matte textured surface.

63. The backlight display device as set forth in Claim 61, wherein the film comprises at least one textured surface comprising two random matte textured surfaces.

64. The backlight display device as set forth in Claim 61, wherein the film has a thickness of about 0.025 mm to about 0.5 mm.

65. The backlight display device as set forth in Claim 61, wherein the particles have a gloss value according to ASTM standard D523 of less than about 50.

66. The backlight display device as set forth in Claim 61, wherein the particles have a gloss value according to ASTM standard D523 of less than about 90.

67. The backlight display device as set forth in Claim 61, wherein said unitary film additionally comprising at least one textured surface for the low scattering of light.

68. A backlight display device comprising:

an optical source for generating light;

a light guide for guiding the light therealong;

a unitary film consisting essentially of polycarbonate and a uniformly dispersed anti-static material comprising a fluorinated phosphonium sulfonate in an amount sufficient to impart anti-static properties to the film,

said film additionally comprising at least one textured surface for the low scattering of light, or

said film additionally comprising a uniformly dispersed acrylic bulk scattering additive of particles having a particle size of from about 3 to about 10 microns in an amount from about 2 to about 7 percent by weight percent for the high scattering of light.

69. The backlight display device as set forth in Claim 68, wherein the acrylic bulk scattering additive comprises a poly(acrylate), or poly(alkyl methacrylate), wherein alkyl groups of the acrylic bulk scattering additive have from one to about twelve carbon atoms.

70. The backlight display device as set forth in Claim 68, wherein the particles comprise a poly(alkyl methacrylate), wherein the alkyl groups of the poly(alkyl methacrylate) have from one to about twelve carbon atoms.

71. The backlight display device as set forth in Claim 68, wherein the acrylic bulk scattering additive comprises poly(alkyl methacrylate) comprising poly(methyl methacrylate).

72. The backlight display device as set forth in Claim 68, wherein said unitary film additionally comprising a uniformly dispersed acrylic bulk scattering additive of particles having a mean particle size of from about 3 to about 10 micrometers and present in an amount from about 2 to about 7 percent by weight percent for the high scattering of light.

73. A light diffusing film for a back light display comprising:

a unitary film consisting essentially of polycarbonate and a uniformly dispersed anti-static material comprising a fluorinated phosphonium sulfonate in an amount sufficient to impart anti-static properties to the film, the surface resistivity of the film being below about 10^{15} ohm/square.

74. A light diffusing film for a back light display comprising:

a unitary film consisting essentially of polycarbonate and a uniformly dispersed anti-static material in an amount sufficient to impart anti-static properties to the film, the unitary film being substantially transparent.

75. The light diffusing film of claim 74, wherein the uniformly dispersed anti-static material comprises a fluorinated phosphonium sulfonate.

76. The light diffusing film of claim 74, wherein the unitary film has a transmission of greater than about 80%.

77. A process for making a light diffusing film comprising polycarbonate, the process comprising:

passing a polymer resin comprising polycarbonate through a 70 micron or less melt filter of porous disks to provide filtered resin;

forming pellets from the filtered resin;

melting and extruding the pellets to form an extruded melt; and

passing the extruded melt through a gap between two calendaring rolls to form the light diffusing film.

78. The process according to claim 77, wherein the light diffusing film formed is the light diffusing film of claim 1.

79. The process according to claim 77, wherein the process has a yield of greater than 90% for producing films having a 17 inch diagonal.

80. A process for making a light diffusing film comprising polycarbonate, the process comprising:

melting and extruding the polymer resin comprising polycarbonate to form an extruded melt; and

passing the extruded melt through a gap between two calendaring rolls to form the light diffusing film having a thickness of at least about .008 inches, and wherein the light diffusing film does not exhibit any visible waving when viewed at any angle.

81. The process according to claim 80, wherein the light diffusing film formed is the light diffusing film of claim 1.

82. A process for making a light diffusing film comprising polycarbonate, the process comprising:

melting and extruding the polymer resin comprising polycarbonate to form an extruded melt; and

passing the extruded melt through a gap between two calendaring rolls to form a web of light diffusing film, a web oscillation speed and a web winding tension being sufficient such that the light diffusing film exhibits no visual gauge bands.

83. The process according to claim 82, wherein the light diffusing film formed is the light diffusing film of claim 1.

84. The process according to claim 82, wherein the web oscillation speed is approximately 0.0 in/min and the web winding tension is approximately 0.18 lbf/in.

85. The process according to claim 82, wherein the web oscillation speed is between approximately 0.2 and 1.0 in/min and the web winding tension is approximately 0.46 lbf/in.

86. A light diffusing film comprising:

a polycarbonate material; and

an ultraviolet absorber (UVA) component in an effective amount to reduce discoloration of the film when exposed to ultraviolet (UV) light, wherein the color shift of the film after 200 hours of accelerated weathering according to the ASTM D4674 method 3 is $dx < 0.0005$ and $dy < 0.0005$, where dx is the shift in the x chromaticity coordinate and dy is the shift in the y chromaticity coordinate according to CIE 1931, and wherein the color shift is measured in reflectance mode using a D65 illuminant and an observer angle of 10°.

87. A light diffusing film comprising:

a polycarbonate material; and

an ultraviolet absorber (UVA) component in an effective amount to reduce discoloration of the film when exposed to ultraviolet (UV) light, wherein the color shift after 50,000 hours operational use in a single lamp LCD is $dx < 0.0005$ and $dy < 0.0005$, where dx is the shift in the x chromaticity coordinate and dy is the shift in the y chromaticity coordinate according to CIE 1931.

88. The light diffusing film as set forth in Claim 87, wherein a color shift of a resin material of the film after five minutes at 600 °F is $dy < 0.0040$, where dy is the shift in the y chromaticity coordinate according to CIE 1931.

89. The light diffusing film as set forth in Claim 87, wherein a color shift of a resin material of the film after five minutes at 600 °F is $dy < 0.0020$, where dy is the shift in the y chromaticity coordinate according to CIE 1931.

90. The light diffusing film as set forth in Claim 87, wherein the addition of the UVA component induces a change in yellowness index (YI) in the film, $\Delta YI < 1$.

91. The light diffusing film as set forth in Claim 87, wherein the addition of the UVA component induces a change in yellowness index (YI) in the film, $\Delta YI < 0.1$.